CERTIFICATE OF VERIFICATION

I, Huysun YE of #187-27 Yongdu-dong, Dongdaemun-gu, Seoul, Republic of Korea state that the attached document is a true and complete translation to the best of my knowledge of the Korean-English language and that the writings contained in the following pages are correct English translation of the specification and claims of the Korean Patent Application Publication No. 2002-73878.

Dated this 3rd day of January, 2008

Signature of translator: Huysun YE

Huysun YE

KOREAN INTELLECTUAL PROPERTY OFFICE

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Application Number: Patent Application No. 2002-73878

Date of Application: November 26, 2002

Applicant(s): LG Electronics Inc.

COMMISIONER

[Translation] P2002-73878

[ABSTRACT OF THE DISCLOSURE]

[ABSTRACT]

Disclosed is a method for controlling drying of laundry in a drum type washing machine, which is capable of setting drying time differently in accordance with a spinning state of the laundry, which includes the steps of: progressing a washing and rinsing cycles along the course preset by a user; executing a spinning cycle after a rinsing process is repeated for a preset times, and detecting a revolutions per minute (RPM) of a motor during the spinning cycle; and adjusting a drying time in correspondence to a detected RPM of the motor after the spinning cycle is finished. The method for controlling drying of laundry has the advantages in that since the drying time is adjusted according to a rotation speed (RPM) of a washing motor in a spinning cycle, a drying cycle time period can be adjusted according to a level of water extraction from the laundry. Accordingly, the clothes are prevented from being wrinkled or insufficiently dried. Moreover, since the drying time is adjusted properly, power can be efficiently consumed.

[TYPICAL DRAWING]

FIG. 3

[KEY WORDS INDEX]

Drum type washing machine with dryer/drying time

[Translation] P2002-73878

[SPECIFICATION]

[TITLE OF THE INVENTION]

METHOD FOR AUTOMATICALLY CONTROLLING DRYING OF LAUNDRY IN DRUM TYPE WASHING MACHINE

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 illustrates a longitudinal section of key parts of a related art drum type washing machine;

FIG. 2 illustrates a section of key parts across a line A-A in FIG. 1; and

FIG. 3 illustrates a flow chart showing the steps of a method for controlling drying of laundry in accordance with a preferred embodiment of the present invention.

Reference numerals of the essential parts in the drawings

10: personnel computer (PC) 20: interface

30: signal input unit 40: voltage sensing part

50: storage part 60: controlling part

70: load driving part

80: liquid crystal display (LCD)

[DETAILED DESCRIPTION OF THE INVENTION]

[OBJECT OF THE INVENTION]

[FIELD OF THE INVENTION AND DISCUSSION OF THE RELATED ART]

The present invention relates to drum type washing machines, and more particularly, to device and method for controlling drying of laundry in a drum type washing machine, which is capable of setting drying time

differently in accordance with a spinning state of the laundry.

Referring to FIGS. 1 and 2, a related art washing and drying machine is provided with a door 2 on a front part of a body 1, a tub 3 in the body 1, a drum 6 in the tub 3 for rotating upon receiving a driving force from a motor through a belt 5, a gasket 7 between a front part of the tub 3 and the body 1 for damping and packing when the drum 6 rotates, a detergent box 9 in an upper part of an inside of the body 1 connected to the tub 3 through a water supply hose 8, a discharge pump 10 and a discharge hose 11 in a lower part of an outside of the tub 3, and a washing heater 12 in a lower of an inside of the tub 3.

The related art washing and drying machine is also provided with a fan 13 in the upper part of the body 1, wherein the fan 13 and the gasket 7 are connected with an air duct 14 such that the fan blows air to insides of the tub 3 and the drum 6, a drying heater 15 in the air duct for heating the air blown through the air duct, a condensing duct 16 connected between the fan 13 and the tub 3 for serving as an air passage, and a condensed water pipe 17 and a water inlet 18 at one side of the body 1 for supplying condensed water into the condensing duct 16 to cool down circulating air with cold water.

Therefore, when a user opens the door 2, introduces

laundry into the drum 6, and selects an operation button, washing water is introduced into the tub 3 through the detergent box 9 guided by the water supply hose 8, until the water fills the tub 3 and the drum 6 in the tub 3 to a required level.

When the washing water is filled in the tub 3 and the drum 6 to the required level 6, the water supply is stopped, the motor 4 rotates in regular/reverse directions, and a driving power of the motor 4 is transmitted to the drum 6 through a belt 5, to rotate the drum 6 in the regular/reverse directions at regular intervals, when the laundry is made fluid by lifts (not shown) on an inside circumferential surface of the drum 6, to progress washing by a friction force between the laundry and the drum, and a dissolving capability of the detergent.

If the user selects a water temperature before starting the washing, the washing water in the drum 6 is heated to the selected temperature as the washing heater 12 generates heat.

Upon finishing a washing cycle, the discharge valve 10 is opened, to discharge used washing water to an outside of the washing machine through the discharge hose 11, and upon finishing the discharge of water, a rinsing cycle is started in the same operation as the washing cycle.

After the rinsing cycle is repeated for a

predetermined times, the motor 4 is rotated in one direction. The above rotating power is transmitted to the drum 6 installed within the tub 3 and rotated along the motor 4 at a high speed, to generate a centrifugal force inside the tub 3. Owing to the centrifugal force, moistures in the laundry tends to drain out in a radial direction to the outside of the tub 3. That is how a spinning cycle is done.

Upon finishing the spinning cycle, the drum 6 is rotated in regular/reverse directions to make the laundry fluid the same as the washing cycle, and the fan 13 is put into operation to blow air into the tub 3 and the drum 6. At this time, the drying heater 15 in the air duct 14 also generates heat, to heat the air blown into the tub 3 and the drum 6. According to this, moisture in the laundry is removed by hot air introduced into the drum 6. The hot air introduced into the drum 6 circulates back to the fan 13 through a condensing duct 16 connected between the fan and the tub 3.

While the hot air is circulating along the condensing duct 16 to dry the laundry in the drum 6, condense water is supplied to the condensing duct 16 passing through the water inlet 18 and then the condensed water pipe 17, to cool down the circulating air with cold water. The hot air circulated through the condensing duct 16 is condensed by

the condense water to become cold and circulated back to the fan 13. The cool water used to condense the hot air is flown beneath the tub 3 and discharged to the outside via the discharge hose 11 with an aid of the discharge pump 10.

[TECHNICAL TASKS TO BE ACHIEVED BY THE INVENTION]

However, in the related art washing and drying machine, since the user carries out the drying cycle for a preset time period in the drying cycle, the drying cycle is progressed regardless of a quantity of the laundry, or a moisture content of the laundry, to cause problems in that the laundry excessively wrinkled, or dried insufficiently

Accordingly, the present invention is directed to device and method for automatically controlling drying of laundry in a drum type washing machine that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

An object of the present invention is to provide device and method for automatically controlling drying of laundry in a drum type washing machine, in which a drying time can be adjusted depending on a rotation power, i.e., revolutions per minute (RPM) of a motor during a spinning cycle.

Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent to those having ordinary skill in the

art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

[PREFERRED EMBODIMENTS OF THE INVENTION]

To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, there is provided a method for automatically controlling drying of laundry in drum type washing machine, including the steps of: progressing a washing and rinsing cycles along the course preset by a user; executing a spinning cycle after a rinsing process is repeated for a preset times, and detecting a revolutions per minute (RPM) of a motor during the spinning cycle; and adjusting a drying time in correspondence to a detected RPM of the motor after the spinning cycle is finished.

It is to be understood that both the foregoing explanation and the following detailed description of the present invention are exemplary and illustrative and are intended to provide further explanation of the invention as claimed.

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are

illustrated in the accompanying drawings. Throughout the drawings, alike elements are indicated using the same or similar reference designations.

The operation of, and a method for controlling drying of laundry in a drum type washing machine in accordance with a preferred embodiment of the present invention will be described, with reference to FIG. 3.

FIG. 3 illustrates a flow chart showing the steps of a method for controlling drying of laundry in accordance with a preferred embodiment of the present invention.

Referring to FIG. 3, once a user input a command to operate a washing, a washing machine starts a washing and rinsing cycles (S11~S12).

After the rinsing cycle is finished, a spinning cycle is progressed, in which the motor sensing part detects a rotation speed of a motor, and a controlling part stores it (S13).

Then, after finishing the spinning cycle, the controlling part determines if a drying cycle is started (S14).

As a result of the determination in step 14, if the drying cycle is started, the controlling part determines whether the maximum value of the rotation speed is equal to or higher than a first set rotation speed, i.e., 1400 RPM (S15).

As a result of the determination in step 15, if the maximum value of the rotation speed is equal to the first set rotation speed, the 1400 RPM, the controlling part sets a drying cycle time period to a first drying time period T1 (S16).

In the meantime, if it is determined in step 15 that the maximum value of the rotation speed is not the first set rotation speed, 1400 RPM, it is determined if the rotation speed is equal to a second rotation speed, i.e., 1200 RPM (S17).

As a result of the determination in step 17, if the maximum value of the rotation speed is equal to the second set rotation speed, the controlling part sets the drying cycle time period to a second drying time period T2 (S18).

However, if it is determined in step 17 that the maximum value of the rotation speed is not the second set rotation speed, 1200 RPM, it is determined if the rotation speed is equal to a third rotation speed, i.e., 1000 RPM (S19).

As a result of the determination in step 19, if the maximum value of the rotation speed is equal to the third set rotation speed, 1000 RPM, the controlling part sets the drying cycle time period to a third drying time period T3 (S20).

If it is determined in step 19 that the maximum value

of the rotation speed is not the third set rotation speed, 1000 RPM, it is determined if the rotation speed is equal to a fourth rotation speed, i.e., 800 RPM (S21).

As a result of the determination in step 21, if the maximum value of the rotation speed is equal to the fourth set rotation speed, 800 RPM, the controlling part sets the drying cycle time period to a fourth drying time period T4 (S22).

Hence, the washing machine progress the drying cycle for any one of the time period selected from the first to fourth drying time period (T1~T4) (S23).

In this instance, the first rotation speed, the second rotation speed, the third rotation speed and the fourth rotation speed satisfy the condition that the first rotation speed is higher than the second rotation speed, the second rotation speed is higher than the third rotation speed, and the third rotation speed is higher than the fourth rotation speed. Moreover, the first, the second, the third and the fourth drying time should meet the condition in that the first drying time is shorter than the second drying time, the second drying time is shorter than the third drying time, and the third drying time is shorter than the fourth drying time (T1<T2<T3<T4).

As mentioned above, the method for automatically controlling a drying time is progressed in such a manner

that after finishing the spinning cycle and the before the drying cycle is started, the controlling part detects the rotation speed of the motor and stores the detected data, and sets the drying time based on the stored data.

[EFFECT OF THE INVENTION]

As has been described, the device and method for controlling drying of laundry in a drum type washing machine of the present invention has the following advantages.

First, since the drying time is adjusted according to a rotation speed (RPM) of a washing motor in a spinning cycle, a drying cycle time period can be adjusted according to a level of water extraction from the laundry.

Second, since the drying time is adjusted according to the level of moist in clothes, the clothes are prevented from being wrinkled or insufficiently dried.

Third, since the drying time is adjusted properly, power can be efficiently consumed.

It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover such modifications and variations, provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A method for automatically controlling drying of laundry in drum type washing machine, comprising the steps of:

progressing a washing and rinsing cycles along the course preset by a user;

executing a spinning cycle after a rinsing process is repeated for a preset times, and detecting a revolutions per minute (RPM) of a motor during the spinning cycle; and

adjusting a drying time in correspondence to a detected RPM of the motor after the spinning cycle is finished.

2. The method as claimed in claim 1, wherein the step of adjusting the drying time comprises the steps of increasing a decrease rate of the drying time as the detected revolutions per minute (RPM) of the motor is higher.

3. The method as claimed in claim 1, wherein the step of adjusting the drying time further comprises the steps of:

setting the drying cycle time to a first drying time period T1 if the maximum value of a rotation speed of the

motor is equal to the first set rotation speed;

setting the drying cycle time to a second drying time period T2 if the maximum value of a rotation speed of the motor is equal to the second set rotation speed;

setting the drying cycle time to a third drying time period T3 if the maximum value of a rotation speed of the motor is equal to the third set rotation speed; and

setting the drying cycle time to a fourth drying time period T4 if the maximum value of a rotation speed of the motor is equal to the fourth set rotation speed.

4. The method as claimed in claim 3, wherein the first to fourth set rotation speeds satisfy condition that the first rotation speed is higher than the second rotation speed, the second rotation speed is higher than the third rotation speed, and the third rotation speed is higher than the fourth rotation speed.

5. The method as claimed in claim 3, wherein the first, the second, the third and the fourth drying time should meet the condition in that the first drying time is shorter than the second drying time, the second drying time is shorter than the third drying time, and the third drying time is shorter than the fourth drying time (T1<T2<T3<T4).

[Translation] P2002-73878

DRAWINGS

FIG. 1

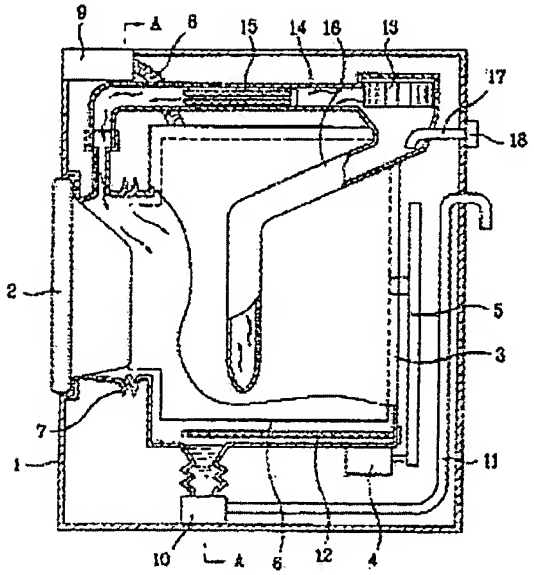

FIG. 2

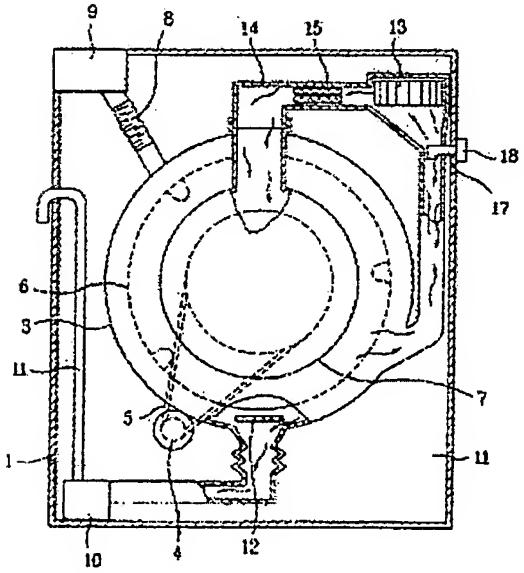

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FIG. 3